

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A heterojunction bipolar transistor comprising:
 - a semiconductor substrate of a first conductivity type including a collector region;
 - a base region formed on said substrate comprising a non-dopant;
 - an emitter region formed over said base region; [[and]]
 - at least one of said collector, ~~base~~ and emitter regions including a first region doped with an impurity having a first concentration and a second region doped with said impurity having a second concentration; and
 - an emitter-base junction region or a collector-base junction region formed by out-diffusion of said impurity from at least one of said first and second regions.
2. (Original) The heterojunction bipolar transistor of claim 1, wherein said base region comprises SiGe.
3. (Original) The heterojunction bipolar transistor of claim 1, wherein said first concentration is less than said second concentration.
4. (Original) The heterojunction bipolar transistor of claim 1, wherein said emitter region comprises said first region doped with a dopant having a first concentration and said second region doped with said dopant having a second concentration greater than said first concentration.
5. (Currently Amended) The heterojunction bipolar transistor of claim 4, wherein said first region is formed closer to [[an]] said emitter-base junction region than said second region.
6. (Currently Amended) The heterojunction bipolar transistor of claim 1, wherein said base

region comprises [[said]] a first base region doped with [[a]] said non-dopant having a first base concentration and [[said]] a second base region doped with said non-dopant having a second base concentration greater than said first base concentration.

7. (Currently Amended) The heterojunction bipolar transistor of claim 6, wherein said first base region is formed closer to [[an]] said emitter-base junction region than said second base region.

8. (Original) The heterojunction bipolar transistor of claim 1, wherein an impurity concentration profile of said first or second regions comprises a step profile or a graded profile.

9. (Currently Amended) A heterojunction bipolar transistor comprising:

a semiconductor substrate of a first conductivity type including a collector region;
a base region formed on said substrate including a first base region doped with a non-dopant having a first concentration and a second base region doped with said non-dopant having a second concentration; [[and]]

an emitter region formed over said base region including a first emitter ~~region doped layer~~ in-situ doped with a dopant having a first concentration and a second emitter ~~region doped layer~~ in-situ doped with said dopant having a second concentration; and

an emitter-base junction region formed by out-diffusion of said dopant from at least one of said first and second emitter layers.

10. (Original) The heterojunction bipolar transistor of claim 9, wherein said base region comprises SiGe.

11. (Currently Amended) The heterojunction bipolar transistor of claim 9, wherein said first base region and said first emitter region layer are formed closer to [[an]] said emitter-base junction region than said second base region and said second emitter region layer.

12. (Original) The heterojunction bipolar transistor of claim 9, wherein said non-dopant comprises carbon.

13. (Currently Amended) The heterojunction bipolar transistor of ~~claim 11~~ claim 12, wherein said first carbon concentration is from about $8 \times 10^{18} \text{ cm}^{-3}$ to about $5 \times 10^{19} \text{ cm}^{-3}$, and said second carbon concentration is from about $1.5 \times 10^{19} \text{ cm}^{-3}$ to about $7 \times 10^{19} \text{ cm}^{-3}$.

14. (Original) The heterojunction bipolar transistor of claim 9, wherein said dopant comprises arsenic.

15. (Original) The heterojunction bipolar transistor of claim 14, wherein said first arsenic concentration is from about $5 \times 10^{19} \text{ cm}^{-3}$ to about $3 \times 10^{20} \text{ cm}^{-3}$, and said second arsenic concentration is from about $1 \times 10^{20} \text{ cm}^{-3}$ to about $7 \times 10^{20} \text{ cm}^{-3}$.

16. (Withdrawn) A method of fabricating a heterojunction bipolar transistor comprising the steps of:

providing a semiconductor substrate of a first conductivity type including a collector region;

forming a base region on said substrate;

forming an emitter region over said base region;

doping a first region of at least one of said collector, base and emitter regions with an impurity having a first concentration; and

doping a second region of said at least one of said collector, base and emitter regions with said impurity having a second concentration.

17. (Withdrawn) The method of claim 16, wherein said first region is formed closer to an emitter-base junction region than said second region.

18. (Withdrawn) The method of claim 16, wherein said first concentration is less than said second concentration.

19. (Withdrawn) The method of claim 16, wherein said steps of doping said first and second regions of said emitter region comprises depositing a first emitter polysilicon layer and a second emitter polysilicon layer.

20. (Withdrawn) The method of claim 16, wherein said steps of doping said first and second regions of said base region comprises:

incorporating said impurity in a gas phase in a deposition process; and
varying an amount of said impurity gas during said deposition process to provide said first and second concentrations.

21. (New) The heterojunction bipolar transistor of claim 1, wherein said first region comprises a first in-situ doped polysilicon layer and said second region comprises a second in-situ doped polysilicon layer.

22. (New) The heterojunction bipolar transistor of claim 9, wherein said first emitter layer comprises a first in-situ doped polysilicon layer and said second emitter layer comprises a second in-situ doped polysilicon layer.